

REMARKS

Claims 1-20 were pending in this application.

Claims 1-20 have been rejected.

Claims 1-4, 9-14, 19, and 20 have been amended as shown above.

Claims 21 and 22 have been added.

Claims 1-22 are now pending in this application.

Reconsideration and full allowance of Claims 1-22 are respectfully requested.

I. OBJECTIONS TO SPECIFICATION

The Office Action objects to various informalities in the specification. The Applicants have amended the specification to correct the noted informalities. Accordingly, the Applicants respectfully request withdrawal of the objections to the specification.

II. REJECTION UNDER 35 U.S.C. § 112

The Office Action rejects Claims 2-10 and 12-20 under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter regarded as the invention. The Applicants have amended Claims 2 and 12 as shown above. These amendments broaden the scope of Claims 2 and 12. These amendments also remove the phrase forming the basis of the § 112 rejection. Accordingly, the Applicants respectfully request withdrawal of the § 112 rejection.

III. REJECTION UNDER 35 U.S.C. § 103

The Office Action rejects Claims 1-6 and 11-16 under 35 U.S.C. § 103(a) as being unpatentable over Applicant Admitted Prior Art (“*APA*”) in view of U.S. Patent No. 5,150,121 to Newell et al. (“*Newell*”). The Office Action rejects Claims 7, 8, 17, and 18 under 35 U.S.C. § 103(a) as being unpatentable over *APA* and *Newell* in further view of U.S. Patent Publication No. 2003/0031273 to Mohindra (“*Mohindra*”). These rejections are respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. (*MPEP* § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992)). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. (*MPEP* § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984)). Only when a *prima facie* case of obviousness is established does the burden shift to the Applicant to produce evidence of nonobviousness. (*MPEP* § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993)). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the Applicant is entitled to grant of a patent. (*In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985)).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. (*In re Bell*, 991 F.2d

781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993)). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on the Applicant's disclosure. (MPEP § 2142).

APA recites a mixer 120A that mixes a local oscillator (LO) reference signal and a radio frequency (RF) signal to produce a down-converted baseband signal. (*Application*, Page 3, Lines 18-21). The LO reference signal is provided by a sine and cosine generator 110, which generates the LO reference signal using an LO reference frequency signal. (*Application*, Page 3, Lines 7-11).

As acknowledged in the Office Action, *APA* lacks any mention of a "local oscillator (LO) circuit" capable of receiving a "local oscillator (LO) reference signal" and a "double sideband (DSB) clock signal" as recited in Claims 1 and 11. *APA* also lacks any mention that the "local oscillator (LO) circuit" is capable of generating an "in-phase product signal" in which a "polarity" of the "LO reference signal" is reversed at a "DSB frequency" of the "DSB clock signal" as recited in Claims 1 and 11. The Office Action asserts that Figure 2 of *Newell* discloses these elements and that it would be obvious to modify *APA* with *Newell*.

Figure 2 of *Newell* illustrates a system for demodulating an in-phase component of a

baseband signal using a frequency-encoded version of a double-sideband suppressed-carrier (DSB-SC) signal. (*Col. 3, Lines 7-12*). A modulator 34 receives a baseband signal and a reference-carrier signal on a signal line 36 from a reference-carrier frequency source 38. (*Col. 4, Lines 44-54*). The modulator 34 may, for example, multiply the baseband signal and the reference-carrier signal to produce a low-level DSB-SC output signal. (*Col. 4, Lines 50-56*). The output of the modulator 34 is processed by additional components (including a voltage-to-frequency converter 54) to produce output signal pulses at terminal 56. (*Col. 4, Line 63 – Col. 5, Line 22*). An up-down frequency counter 58 counts the output signal pulses, and the counter 58 counts up or down depending on the reference-carrier signal from the reference-carrier frequency source 38. (*Col. 5, Lines 22-38*). The output of the counter 58 may include digital words that represent an integral of an originally encoded baseband signal. (*Col. 5, Lines 43-50*).

Presumably, the Office Action relies on the reference-carrier signal from the reference-carrier frequency source 38 of *Newell* as representing the “local oscillator (LO) reference signal” recited in Claims 1 and 11. Only two components in Figure 2 of *Newell* receive the reference-carrier signal, the modulator 34 and the counter 58.

The modulator 34 of *Newell* receives a baseband signal and the reference-carrier signal from the reference-carrier frequency source 38. The modulator 34 produces a low-level DSB-SC output signal. However, nothing in *Newell* indicates that the output of the modulator 34 (the low-level DSB-SC output signal) represents a signal in which a polarity of the reference-carrier signal from the reference-carrier frequency source 38 is reversed at a frequency of the baseband signal. As a result, the modulator 34 of *Newell* cannot disclose, teach, or suggest a “local

oscillator (LO) circuit” capable of receiving a “local oscillator (LO) reference signal” and a “double sideband (DSB) clock signal” and generating therefrom an “in-phase product signal” in which a “polarity” of the LO reference signal is reversed at a “DSB frequency” of the “DSB clock signal” as recited in Claims 1 and 11.

The counter 58 of *Newell* receives output signal pulses from the voltage-to-frequency converter 54 and the reference-carrier signal from the reference-carrier frequency source 38. The counter 58 generates digital words representing an integral of a baseband signal. However, nothing in *Newell* indicates that the output of the counter 58 (the digital words) represents a signal in which a polarity of the reference-carrier signal from the reference-carrier frequency source 38 is reversed at a frequency of the output signal pulses from the voltage-to-frequency converter 54. *Newell* simply recites that the counter 58 counts up or down depending on the polarity of the reference-carrier signal from the reference-carrier frequency source 38. Nothing in *Newell* indicates that the counter 58 is reversing the polarity of the reference-carrier signal from the reference-carrier frequency source 38 or that this reversing is based on a frequency of the output signal pulses from the voltage-to-frequency converter 54. As a result, the counter 58 of *Newell* cannot disclose, teach, or suggest a “local oscillator (LO) circuit” capable of receiving a “local oscillator (LO) reference signal” and a “double sideband (DSB) clock signal” and generating therefrom an “in-phase product signal” in which a “polarity” of the LO reference signal is reversed at a “DSB frequency” of the “DSB clock signal” as recited in Claims 1 and 11.

In addition, Claims 1 and 11 recite that a “radio frequency (RF) mixer” has an “input port” capable of receiving an “in-phase product signal,” which is produced by a “local oscillator

(LO) circuit.” In order to reject Claims 1 and 11, the Office Action must show that the output of the circuit in Figure 2 of *Newell* (the alleged “local oscillator (LO) circuit”) would be provided to the mixer 120A of *APA*. The Office Action cannot make this showing.

The output of the counter 58 in *Newell* represents an integral of a baseband signal, which is generated using the baseband signal. The purpose of the circuit in Figure 1 of *APA* is to generate a baseband signal (I-channel and Q-channel baseband signals) using a radio frequency signal. The Office Action has to show that it is obvious to use the output of the circuit in Figure 2 of *Newell* (where the output contains digital words representing a recovered baseband signal) as an input to the mixer 120A of *APA* (which is used to recover a baseband signal). In other words, the Office Action has to show that a person skilled in the art would provide digital words representing a recovered baseband signal to a mixer so that the mixer can recover the baseband signal. A person skilled in the art would clearly not use a recovered baseband signal from the circuit in Figure 2 of *Newell* in order to recover the baseband signal in *APA*. Such a modification would require that the same baseband signal be recovered twice.

For these reasons, the Office Action has not established that the proposed *APA-Newell* combination discloses, teaches, or suggests the Applicants’ invention as recited in Claims 1 and 11 (and their dependent claims). Accordingly, the Applicants respectfully request withdrawal of the § 103 rejection and full allowance of Claims 1-8 and 11-18.

IV. NEW CLAIMS

The Applicants have added new Claims 21 and 22. The Applicants respectfully submit

that no new matter has been added. At a minimum, the Applicants respectfully submit that Claims 21 and 22 are patentable for the reasons discussed above. The Applicants respectfully request entry and full allowance of Claims 21 and 22.

V. **CONCLUSION**

The Applicants respectfully assert that all pending claims in this application are in condition for allowance and respectfully request full allowance of the claims.

SUMMARY

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@davismunck.com*.

The Applicants have included the appropriate fee to cover the cost of this AMENDMENT AND RESPONSE. The Commissioner is hereby authorized to charge any additional fees connected with this communication (including any extension of time fee) or credit any overpayment to Davis Munck Deposit Account No. 50-0208.

Respectfully submitted,

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